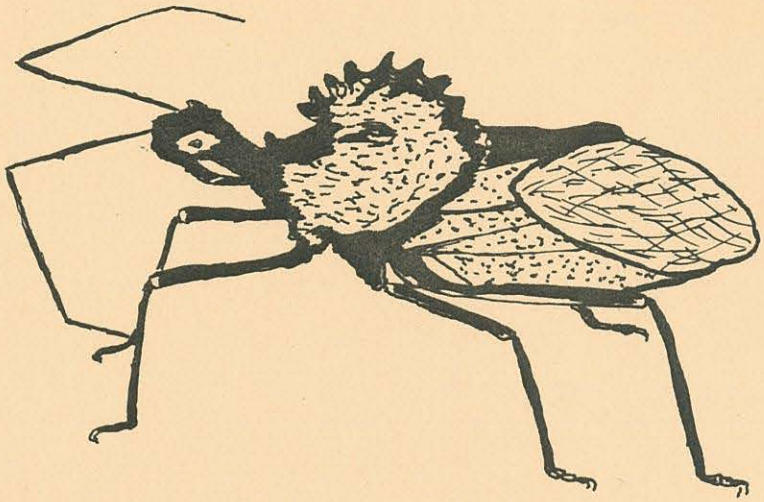
MISSOURI FOREST PEST REPORT 1977



FORESTRY DIVISION

MISSOURI DEPARTMENT OF CONSERVATION

FOREST PEST ACTIVITY IN MISSOURI — 1977

FORESTRY DIVISION
MISSOURI DEPARTMENT OF CONSERVATION
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Compiled by:
Ramon D. Gass, Forest Insect and Disease Specialist
and
S. Olin Phillips, Forest Pathologist

Cover: All insects fill their own niche in nature. The wheel bug, *Arilus cristatus* is a beneficial predaceous bug which destroys harmful insects.

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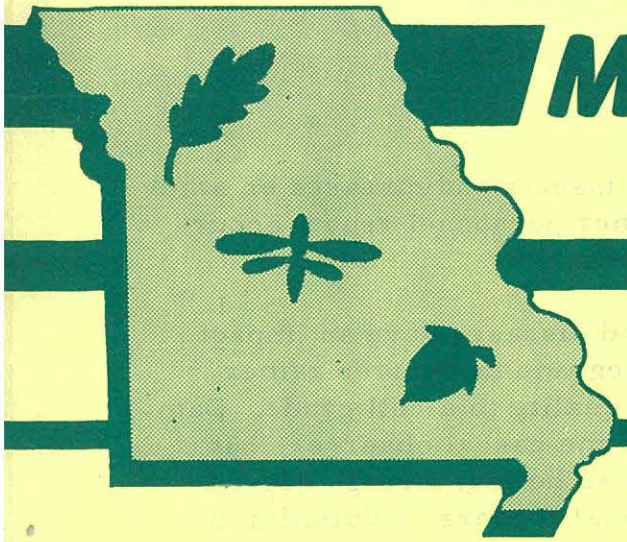

MISSOURI FOREST PEST REPORT

1977 FORESTRY DIVISION - MISSOURI CONSERVATION COMMISSION Vol. XVI

Introduction

Forest insect and disease problems considered in this report were either a problem in 1976, caused aesthetic damage to the forest, are a potential problem, endangered the quality of vegetation appearance, or caused log degrade and lumber value loss.

Interest by the public in tree quality and survival and related subjects increases each year. These range from defoliation to hardwood borers to the control of wasps, bees and hornets.

This year, 1977, started out to be very dry over most portions of the states. Rains brought relief to parched areas beginning in late August. By October 1st most areas of the state had received adequate moisture and in many areas subsoil moisture was replenished. Some sections of the state actually exceed the normal for October by four or five inches of rainfall.

Drought is still a factor, however, that always looms on the horizon and it did consume a portion of our time during 1977.

Except for small infestations and disease occurrences, 1977 was generally good in that the state was low in pest incidence. The gypsy moth demanded a certain amount of time. No male moths were trapped in Missouri in 1977.

The Program

In 1962 a cooperative program, the Forest Pest Control Program, was entered into with the U. S. Forest Service by the Forestry Division, Missouri Department of Conservation. Under the original agreement this effort is designed to

detect, evaluate or appraise and control forest insects and diseases on state and private land. Department foresters and other personnel report occurrences of damaging insects, diseases and animals.

Although difficult to measure, forest insects and diseases have an impact on Missouri forests. Some of this damage is degrade to the tree rather than mortality. This degrade may reduce tree quality to a cull grade. Damage by hardwood borers often goes unnoticed by the casual observer, but foresters acknowledge that millions of dollars can be lost through degrade and growth loss by hardwood borers, pine cambial feeders, defoliating insects, vascular diseases and rots.

More subtle but very significant is cumulative stress placed upon forest and shade trees by insects, diseases, drought and other natural and artificial factors. During the early part of this summer plants suffered from the drought stress placed upon them by the lack of rainfall. Many plants lost their leaves in July and August. Some of these trees have responded to late summer rains. Some will not respond. Some of those trees weakened this summer from drought will be predisposed to possible attacks by primary and secondary insects and wood-rotting fungi. When drought conditions occur, favorite shade trees and shrubs can be helped by deep-watering and broadcast or deep fertilizing. These steps may help increase the vigor of a plant to resist attacks from insects and diseases.

Conditions in Brief

Winter, 1976-1977, was severely cold. A number of insect species populations were reduced as a result of the bitter cold; others were not. Because of the absence of late killing frost, fruit crops were exceptionally good. Commercial fruit production was excellent as were the walnut, persimmon, serviceberry, redbud and oak nut and fruit crops. The severe cold may have stimulated fruit production on most tree species.

Missouri rainfall averages are normal to above normal for October. In 1976 we were behind 10 to 14 inches.

State-wide insect and disease problems were minor. Fall webworm populations were heavy wherever their host tree species occurred. Walnut Datana was moderate to heavy on black walnut in southwest Missouri.

Not all insect and disease occurrences have been reported here. It is impossible to detect every small infestation or infection center in the state. Likewise, some additional detection work will be done after this report has been written.

All pests reported here have been either observed by Ramon D. Gass, Forest Insect and Disease Specialist, S. Olin Phillips, Forest Pathologist, or by our Department foresters.

* * * * * * * * * * *

GYPSY MOTH, Porthetria dispar., (L.). No male moths were trapped in the 2,000 traps that were located and monitored over the state by personnel of the State Department of Agriculture, U.S.D.A., A.P.H.I.S. and Missouri Department of Conservation. Participating in the program were Ray Bruns with Union Electric in St. Louis and John Grinstead at Fort Leonard Wood.

VARIABLE OAK LEAF CATERPILLAR, Heterocampa manteo (Dbldy.) was not reported during 1977.

BLACK TURPENTINE BEETLE, Dendroctonus terebrans, (Oliv.) infested weakened sawlog size shortleaf pine in a number of counties where tree mortality was negligible and scattered.

ASIATIC OAK WEEVIL, Cyrtepistomus castaneus, (Roelofs), infested hardwood forests over the state. Defoliation was common and ranged from three to ten percent of leaf surface.

NANTUCKET PINE TIP MOTH, Rhyacionia frustrana, (Comst.) populations were considerably reduced in 1977 by the severe winter. The third generation was noticeable on shortleaf pine plantations on poor sites out of the natural range.

EUROPEAN PINE SAWFLY, Neodiprion sertifer, (Geoff), was not reported during 1977.

LOBLOLLY PINE SAWFLY, Neodiprion taedae linearis, (Ross) defoliation decreased from 1976 and was very light in several areas in 1977.

REDHEADED PINE SAWFLY, Neodiprion lecontei, (Fitch), was very light in 1977.

EASTERN TENT CATERPILLAR, Malacosoma americanum, (F.), occurred in small to moderate numbers on eastern black cherry in 1977.

EVERGREEN BAGWORM, Thyridopteryx ephemeraeformis, (Haw.) defoliation was moderate to heavy on Pfitzer evergreens over the state. Defoliation was light on naturally occurring eastern redcedar. Ornamental defoliation still is a continuing problem.

FALL WEBWORM, Hyphantria cunea, (Drury), was heavy in most areas this year.

WALNUT CATERPILLAR, Datana integerrima, (G. and R.), populations were heavy on black walnut on southwest Missouri in 1977.

OAK WILT, Ceratocystis fagacearum, (Bretz, Hunt), occurred in at least 20 counties in Missouri in 1977.

Projects

Every opportunity was taken to inform the public of the status of forest insects and diseases in the state. This was accomplished through contacts and diagnostic service.

Because of our team effort between Forestry Division staff specialists and Department foresters, over 600 forest and shade tree requests were serviced over the state in 1977. Field assistance was available to all foresters and other personnel. Staff specialists serviced over 300 pest related telephone calls. Diagnoses made numbered 250 from all over the state.

No problems were discovered during periodic visits to seed production areas or Natural Areas.

Periodic visits to the Goerge O. White State Forest Nursery revealed no serious pest problems.

Several days were spent with various Christmas Tree Producers in the state.

A total of seven Forest Insect and Disease Status Reports (March through September) were prepared and sent to all Missouri Christmas Tree Producers, most Department personnel and other individuals totaling 650 copies per month.

The section "Gypsy Moth Watch" in the 1977 Status Reports was supported by other states' input. We thank those entomologists who sent us information regarding the status of gypsy moth in their states. The original intent of this section was to include information about the gypsy moth in the midwest.

Hardwood Borers and Defoliators

GYPSY MOTH, Porthetria dispar, (L.). Although no moths were collected in traps during 1977 in Missouri, the number one effort is to educate the public about the devastating potential of this moth.

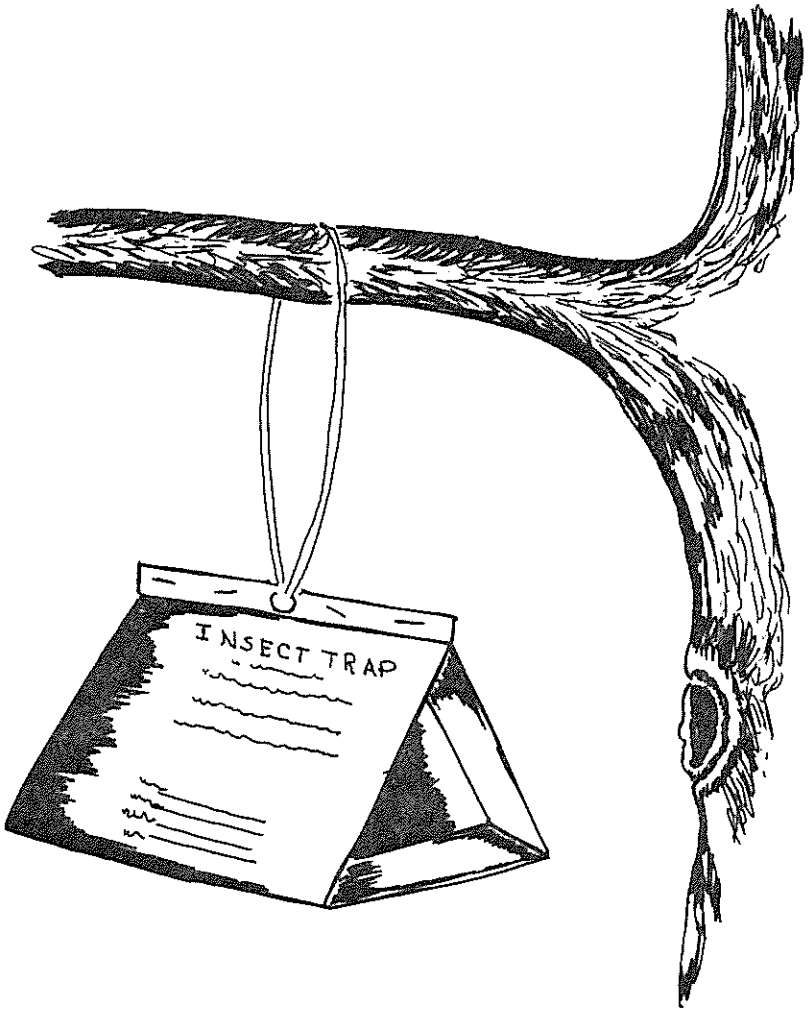

Figure 1 - Gypsy Moth Trap

GYPSY MOTH
k
a
e
b
i
l
g
f
h
k
Close-up of a, ovipositing female; b, male; c, female pupa; d, male pupa; e, old egg mass. Larvae on oak leaf: f, First instar; g, second instar; h, fourth instar; i, sixth instar, or mature larva. Egg masses, k, under branches and on rock; l, young larvae spinning down. (a to i, about natural size; k and l, reduced.)

Figure 2 - Life Stages of the Gypsy Moth

The life cycle of the gypsy moth parallels that of a number of other insects. The gypsy moth is not native to the United States and larvae feed on a great variety of hardwood foliage in spring and early summer. Three repeated defoliations may kill hardwood trees. One defoliation may kill evergreen trees.

Gypsy moths overwinter in masses on bark, rocks, litter, or on man-made objects.

USS-33676

Egg masses on tree.

Figure 3 - Gypsy Moth Egg Masses

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VARIABLE OAK LEAF CATERPILLAR, Heterocampa manteo, (Dbldy.), was not detected in Missouri during 1977.

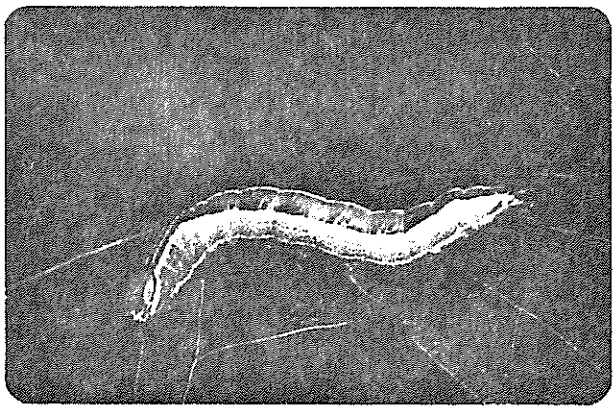

Figure 4 - Variable Oak Leaf Caterpillar

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The Carpenterworm, Prionoxystus robiniae, (Peck); Red Oak Borer, Enapholodes rufulus, (Haldeman); and other living tree hardwood borers continue to infest hardwood stands. Trend - Infestation will continue to occur in trees on poorer sites. Estimated dollar loss to hardwood borer degrade amounts to over $600,000 annually. Hardwood borers are probably the major insect pest on ornamental plantings. Suppression - stand conversion and selective harvest was conducted in various timber sales over the state. Shade tree owners controlled borers in high value trees on a limited basis.

Figure 5 - Carpenterworm Larva

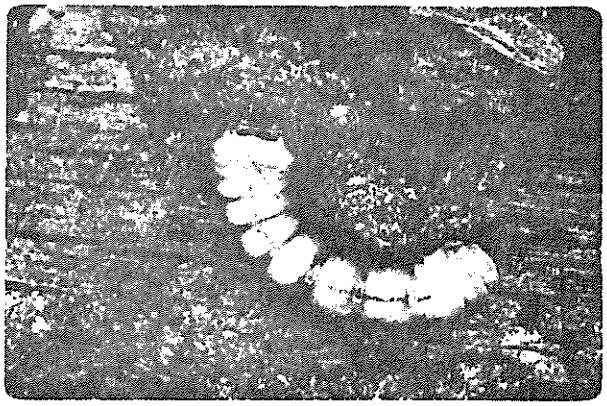

Figure 6 - Red Oak Borer Larva

The Cottonwood Twig Borer, Gypsonoma haimbachiana: Cottonwood Borer, Plectrodera scalator; Cottonwood Leaf Beetle, Chrysomela scripta, (F.), and Poplar Tent Maker, Ichthyura inclusa, continue to infest cottonwood where it grows. Borer damage is greater on trees growing on poorer sites. Defoliation by the poplar tent maker occurs almost everywhere on cottonwood. Trend - no increase in infestation is anticipated in 1978. Suppression - no control was conducted for any of these pests in 1977.

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Asiatic Oak Weevil, Cyrtepistomus castaneus (Roelofs), was widespread and very abundant in Missouri this year. Defoliation ranged from between five and 20 percent on infested trees. Trend - populations will continue to spread and increase in size in 1978. Suppression - there is no practical control for the beetle under forest conditions.

* * * * * * * * * * *

Figure 7 - Web of Fall Webworm

Fall Webworm, Hyphantria cunea, (Drury), infestation state-wide was heavy. Many areas in southwest Missouri were heavily infested. Defoliation and webbing was present on walnut, persimmon, hickory and sycamore. Many saplings were completely enveloped by webs. Trend - moderate to heavy defoliation should continue in 1978 in many areas of the state. Suppression - with the exception of individual colony control on ornamentals and nut orchards, no widespread control was attempted.

Figure 8 - Larvae and Web of Eastern Tent Caterpillar

Eastern Tent Caterpillar, Malacosoma americanum, (F)., occurred in small numbers this spring, 1977. Trend - populations may build somewhat in 1978 wherever black cherry grows. Suppression - no suppression was necessary.

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Figure 9 - Walnut Caterpillar

The Walnut Caterpillar, Datana integerrima, (G. and R.), populations were moderate to heavy in southwest Missouri. In other areas infestations were light to moderate. A number of species of Datana were observed on sumac and noticeably on various species of Vaccinium.

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Figure 10 - Galls of Maple Bladder Gall Mite on Silver Maple

Maple Bladder Gall Mite, Vasates quadripes, was reported on silver maple from various parts of the state. Infestation was very light.

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Pine Trunk Borers, Twig Borers and Terminal Feeders

Nantucket Pine Tip Moth, Rhyacionia frustrana, (Comst.), and related species were light in 1977. Random shortleaf plantings out of its natural range were heavily infested by the third generation tip moth. Severe 1976-77 winter was responsible for freezing of overwintering pupae, thus severely curbing the first and second generations this summer. Trend - population size in 1978 will depend upon the severity of the 1977-78 winter. Suppression - no practical chemical controls are used by plantation owners in the state.

* * * * * * * * * * *

Black Turpentine Beetle, Dendroctonus terebrans, (Oliv.), infested shortleaf pines in a number of counties this year. Lightning-struck trees attracted beetles in several cases. Only individual trees were infested over the botanical range of shortleaf pine. Infestation was subnormal this year for Missouri conditions. Trend - light infestations are predicted where shortleaf pine have been disturbed or are in a weakened condition. Suppression - where infestations occurred, recommendations were made to fell trees and either salvage or burn them.

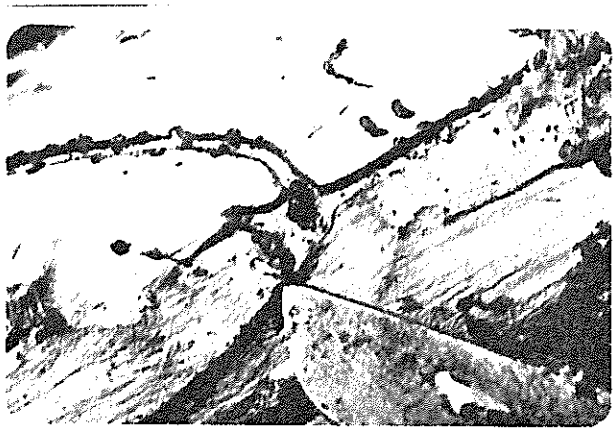

Figure 11 - Ips Beetle and Galleries

Ips Beetle, Ips pini, infested shortleaf pine already weakened or attached by the black turpentine beetle. Infestation in 1977 paralleled that of the black turpentine beetle.

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Pine Defoliators

European Pine Sawfly, Neodiprion sertifer, (Geoff.), was not a serious problem in 1977. No reports were received regarding this insect. Trend - populations should be at a low level in 1978. Suppression - none was necessary in 1977.

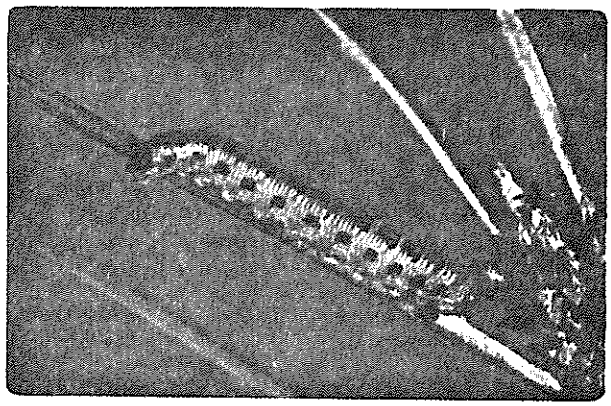

Figure 12 - Larva of Redheaded Pine Sawfly

Redheaded Pine Sawfly, Neodiprion lecontei, (Fitch), caused very little defoliation on shortleaf pine in 1977. Trend - defoliation should be minimal in 1978. Suppression - no control was necessary in 1977.

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Loblolly Pine Sawfly, Neodiprion taedae linearis, (Ross), caused very light defoliation on scattered planted shortleaf pine during 1977. The severe winter was probably responsible along with parasites and virus for low population levels. Trend - defoliation is expected to be light in 1978. Suppression - none was necessary.

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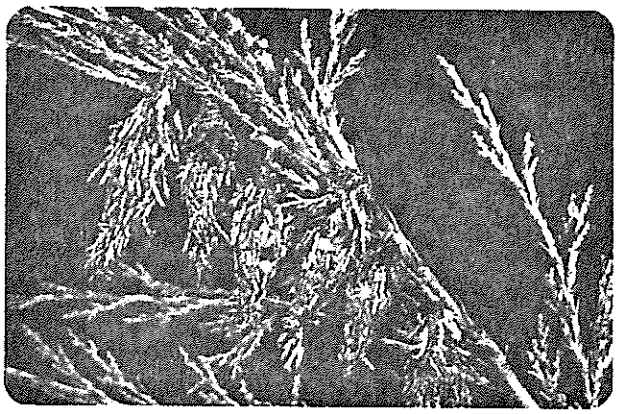

Figure 13 - Evergreen Bagworms

Evergreen Bagworm, Thyridopteryx ephemeraeformis, (Haw.), populations were high over the state on ornamental evergreens. Naturally occurring cedars infested in 1976 were reinfested in 1977. Ornamental pfitzer junipers were heavily hit. Trend - high populations will continue in 1978. Suppression - evergreen owners sprayed their shrubs.

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Forest Diseases

Oak Wilt, Ceratocystis fagacearum, (Bretz, Hunt), occurred in isolated situations over the state. Probable new counties were added to the existing list. Infection was up from 1976.

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Figure 14 - Sporophores of Fomes annosus

Annosus Root Rot, Fomes annosus, (Fr.), Cke., was not reported in 1977. Control is recommended where pine thinnings have been made in high value areas such as parks, campgrounds and other recreation areas.

Figure 15 - "Galls" of Cedar-Apple Rust on Eastern Redcedar

Cedar-Apple Rust, Gymnosporangium juniperi-virginianae, annually infects cedars and plants in the apple family. Cedars and apple trees may be sprayed with fungicide to control infection of the plants.

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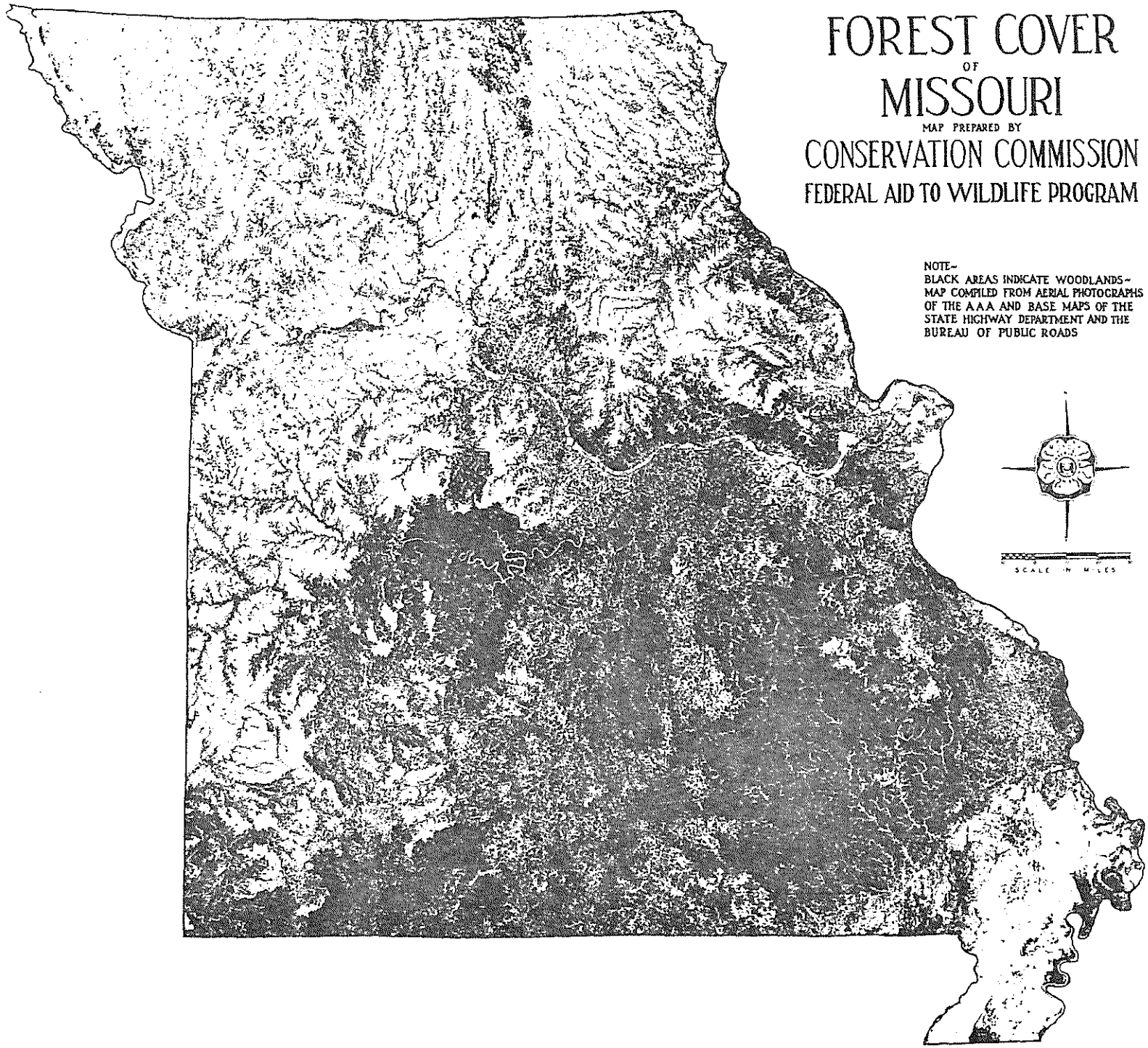
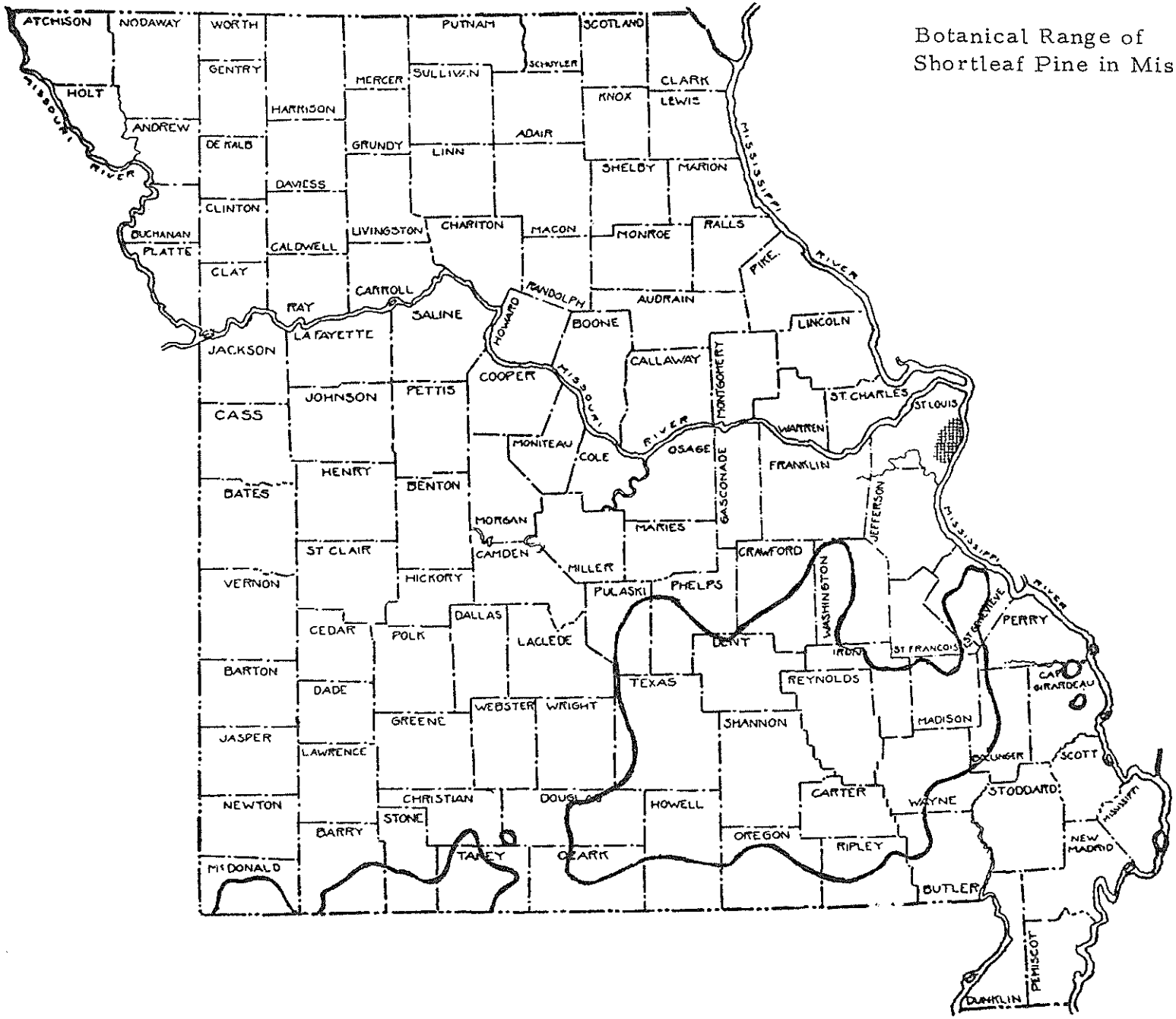
Conclusion

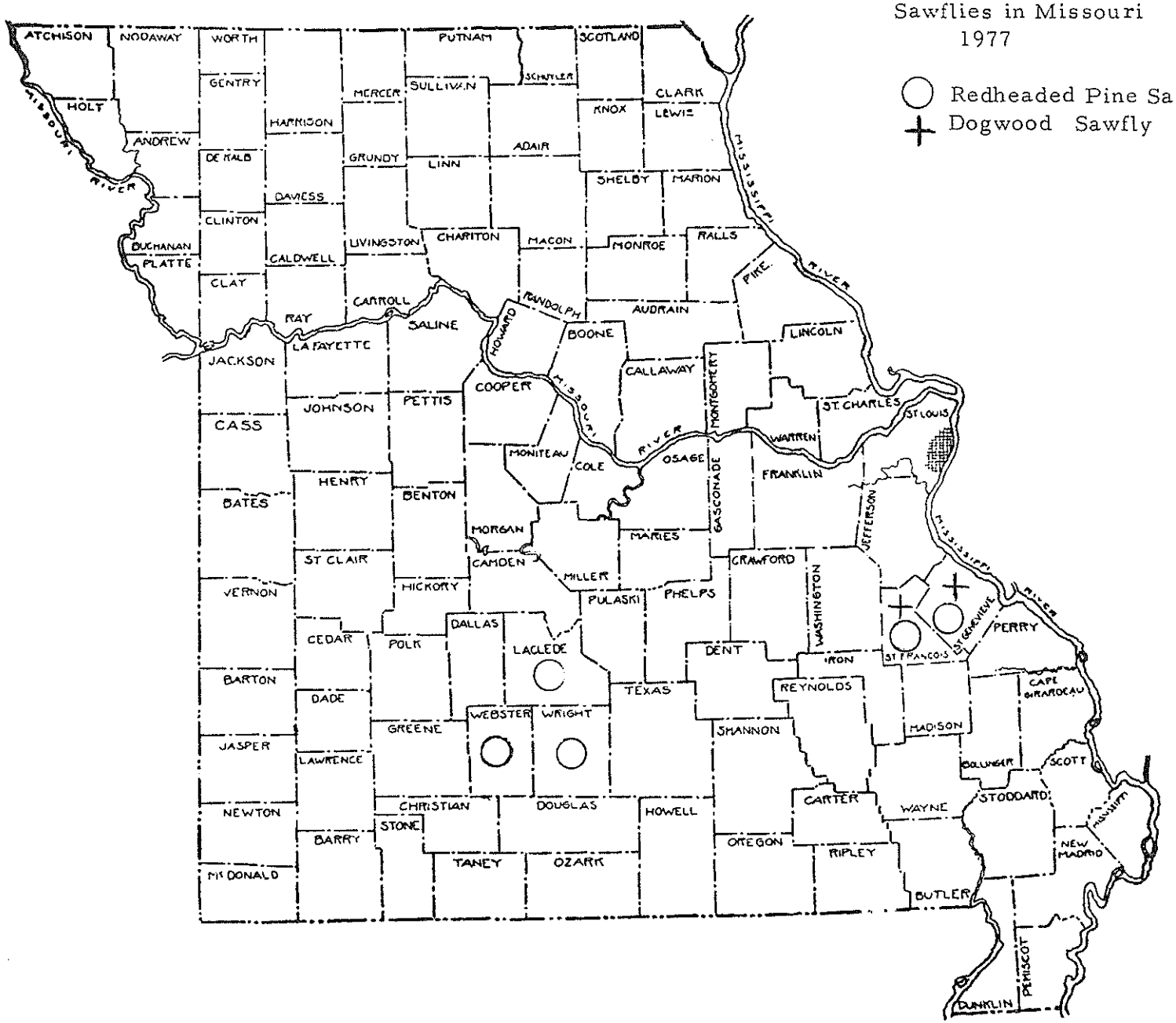
Drought in early and middle summer and hardwood borer damage to ornamental trees were the two most glaring problems during 1977. Late summer and fall rainfalls served to temporarily relieve drought stress on Missouri plants. Neither problem is easily solved.

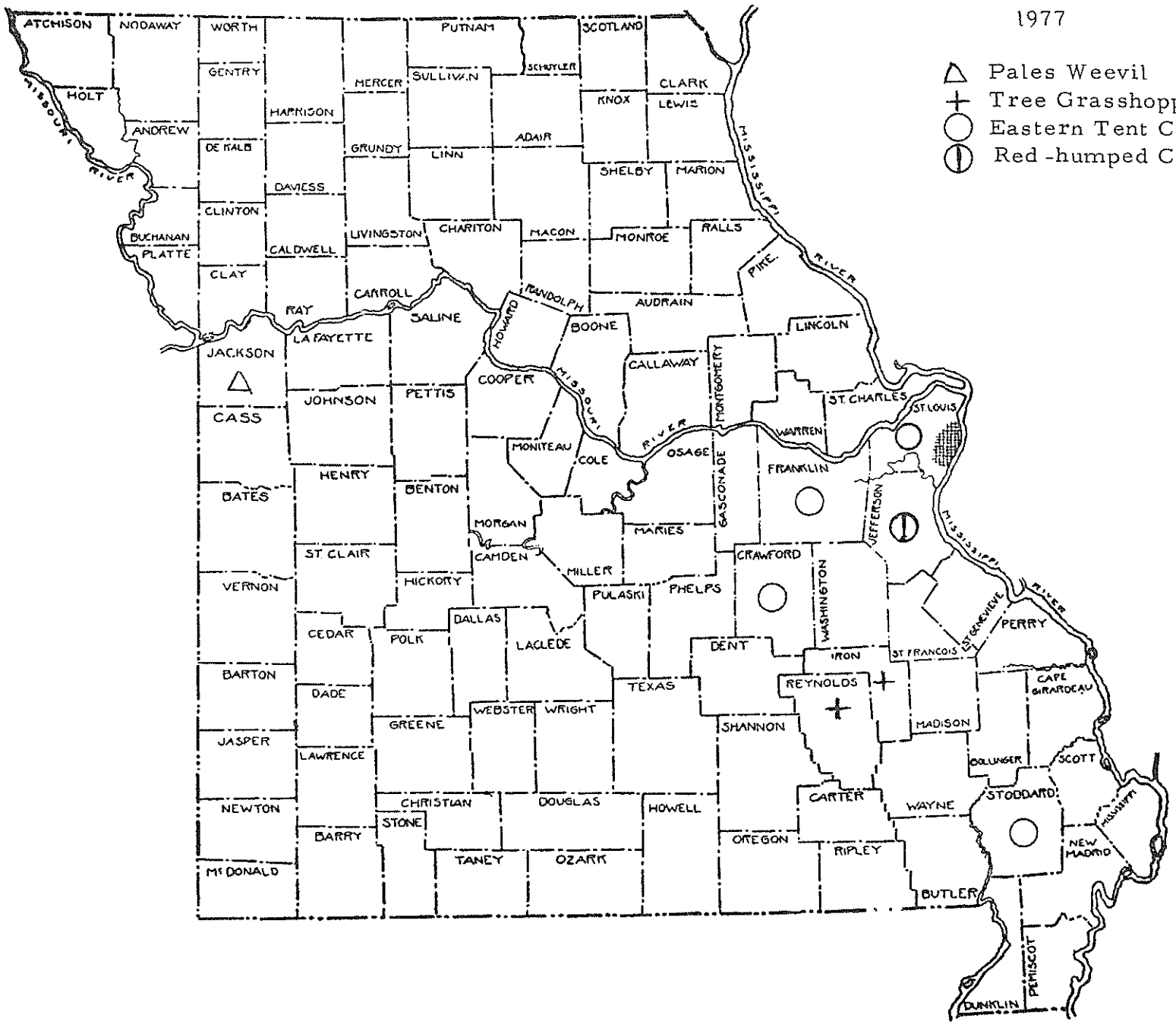
The active growing season, 1977, was filled with many activities that were directed toward informing our foresters and assisting the public of being aware of forest insect and disease conditions over the state. This year, 1977, was a busy one informing the public of insect and disease conditions and of the threat of the gypsy moth in the midwest. The most significant of all activities was working with the public and Department personnel and providing service to all who sought answers to their pest problems. This service is available to every citizen of the state. We appreciate the assistance of those foresters who submitted reports and observations about pests and those who kept a watchful eye on the forests in their districts. Their efforts made the Forest Pest Control Program more effective and meaningful.

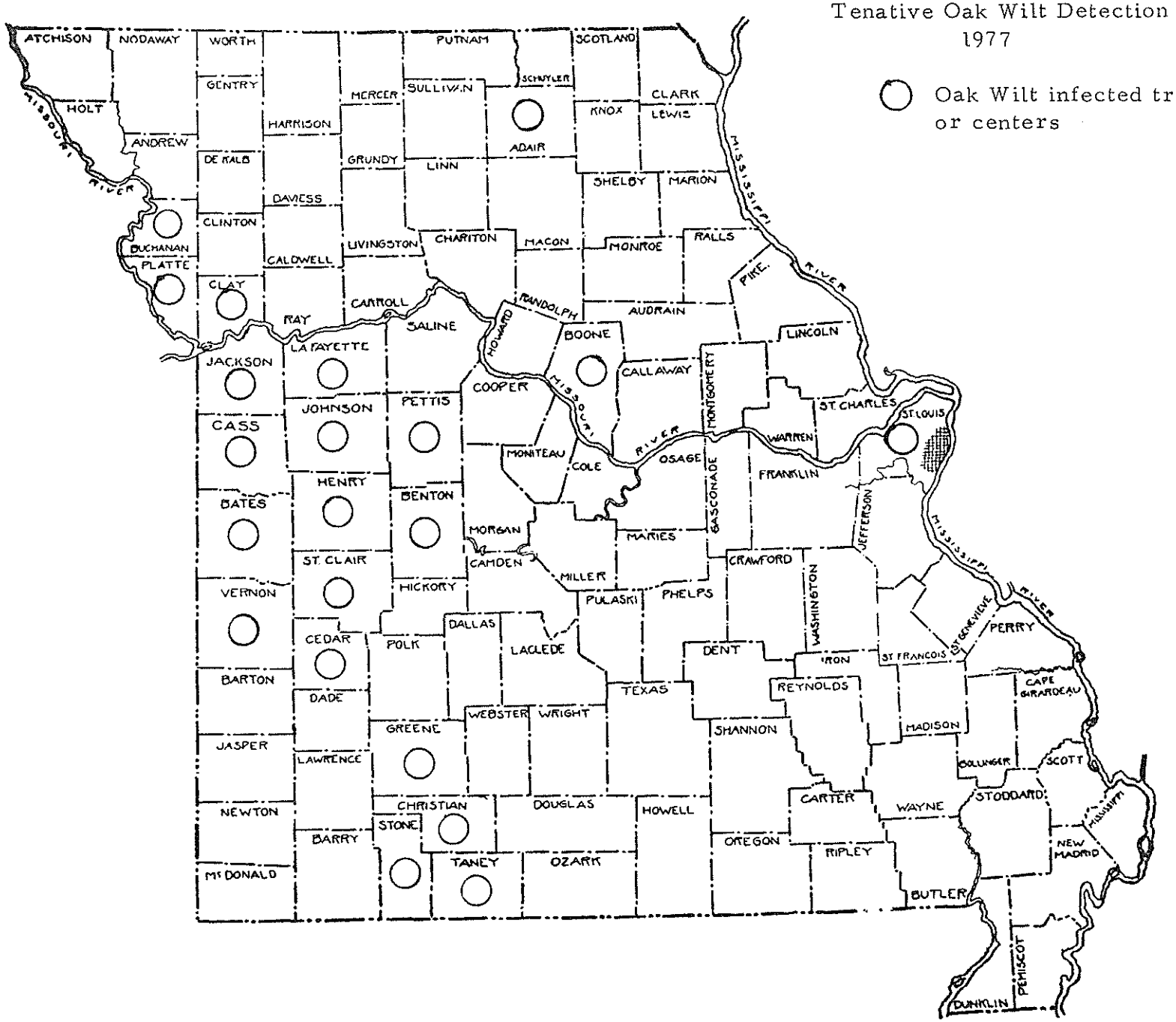

FOREST COVER
OF
MISSOURI
MAP PREPARED BY
CONSERVATION COMMISSION
FEDERAL AID TO WILDLIFE PROGRAM
NOTE-
BLACK AREAS INDICATE WOODLANDS-
MAP COMPILED FROM AERIAL PHOTOGRAPHS
OF THE AAA AND BASE MAPS OF THE
STATE HIGHWAY DEPARTMENT AND THE
BUREAU OF PUBLIC ROADS
SCALE IN MILES



Botanical Range of
Shortleaf Pine in Missouri


Sawflies in Missouri
1977
Redheaded Pine Sawfly
Dogwood Sawfly
ATCHISON
NODAWAY
WORTH
PUTNAM
SCOTLAND
GENTRY
MERCER
SULLIVAN
SCHUYLER
CLARK
HOLT
KNOX
LEWIS
HARRISON
ANDREW
ADAIR
DE KALB
GRUNDY
LINN
SHELBY
MARION
DAVIESS
CLINTON
BUCHANAN
LIVINGSTON
CHARITON
MACON
MONROE
RALLS
PLATTE
CALDWELL
CLAY
PIKE
CARROLL
RANDOLPH
AUDRAIN
RAY
SALINE
HOWARD
BOONE
LINCOLN
LAFAYETTE
JACKSON
COOPER
CALLAWAY
MONTGOMERY
ST CHARLES
ST LOUIS
JOHNSON
PETTIS
CASS
MONITEAU
COLE
OSAGE
WARREN
FRANKLIN
HENRY
BENTON
BATES
GASCONADE
JEFFERSON
MORGAN
MARIES
ST CLAIR
CAMDEN
MILLER
CRAWFORD
VERNON
HICKORY
PULASKI
PHELPS
WASHINGTON
DALLAS
PERRY
CEDAR
POLK
LACLEDE
DENT
ST FRANCOIS
STE GENEVIEVE
IRON
BARTON
TEXAS
REYNOLDS
CAPE GIRARDEAU
DADE
WEBSTER
WRIGHT
GREENE
SHANNON
MADISON
JASPER
LAWRENCE
BOLLINGER
SCOTT
CARTER
WAYNE
STODDARD
NEWTON
CHRISTIAN
DOUGLAS
HOWELL
STONE
BARRY
OREGON
RIPLEY
NEW MADRID
MC DONALD
TANEY
OZARK
BUTLER
DUNKLIN
PEMISCOT


Forest Insects
1977
Pales Weevil
Tree Grasshopper
Eastern Tent Caterpillar
Red-humped Caterpillar
ATCHISON
NODAWAY
WORTH
PUTNAM
SCOTLAND
GENTRY
SCHUYLER
CLARK
HOLT
MERCER
SULLIVAN
KNOX
LEWIS
HARRISON
ANDREW
ADAIR
DE KALB
GRUNDY
LINN
SHELBY
MARION
DAVIESS
CLINTON
LIVINGSTON
CHARITON
MACON
MONROE
RALLS
BUCHANAN
CALDWELL
PIKE
PLATTE
CLAY
CARROLL
RANDOLPH
AUDRAIN
RAY
SALINE
BOONE
LINCOLN
LAFAYETTE
HOWARD
JACKSON
CALLAWAY
COOPER
MONTGOMERY
ST. CHARLES
JOHNSON
PETTIS
ST. LOUIS
CASS
MONITEAU
WARREN
COLE
OSAGE
FRANKLIN
HENRY
BENTON
GASCONADE
JEFFERSON
BATES
MORGAN
MARIES
ST. CLAIR
CAMDEN
CRAWFORD
MILLER
PULASKI
PHELPS
WASHINGTON
VERNON
HICKORY
PERRY
CEDAR
POLK
DALLAS
LACLEDE
DENT
IRON
ST. FRANCOIS
STE. GENEVIEVE
BARTON
TEXAS
REYNOLDS
CAPE GIRARDEAU
DADE
WEBSTER
WRIGHT
GREENE
SHANNON
MADISON
JASPER
LAWRENCE
BOLLINGER
SCOTT
CARTER
WAYNE
STODDARD
NEWTON
CHRISTIAN
DOUGLAS
HOWELL
STONE
BARRY
OREGON
RIPLEY
NEW MADRID
TANEY
OZARK
Mc DONALD
BUTLER
DUNKLIN
PEMISCOT
MISSOURI RIVER
MISSISSIPPI RIVER


Tenative Oak Wilt Detection
1977
Oak Wilt infected trees or centers
ATCHISON
NODAWAY
WORTH
PUTNAM
SCOTLAND
GENTRY
SCHUYLER
CLARK
KNOX
LEWIS
HOLT
MERCER
SULLIVAN
ADAIR
HARRISON
ANDREW
DE KALB
GRUNDY
LINN
SHELBY
MARION
DAVIESS
CLINTON
LIVINGSTON
CHARITON
MACON
MONROE
RALLS
BUCHANAN
PLATTE
CALDWELL
CLAY
CARROLL
RANDOLPH
AUDRAIN
PIKE
RAY
SALINE
HOWARD
BOONE
LINCOLN
JACKSON
LAFAYETTE
COOPER
CALLAWAY
MONTGOMERY
ST CHARLES
ST LOUIS
JOHNSON
PETTIS
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WARREN
MONITEAU
COLE
OSAGE
FRANKLIN
HENRY
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BATES
MORGAN
MARIES
GASCONADE
JEFFERSON
ST CLAIR
CAMDEN
CRAWFORD
MILLER
VERNON
HICKORY
PULASKI
PHELPS
WASHINGTON
DALLAS
CEDAR
POLK
LACLEDE
DENT
IRON
ST FRANCOIS
STE GENEVIEVE
PERRY
BARTON
DADE
TEXAS
REYNOLDS
CAPE GIRARDEAU
GREENE
WEBSTER
WRIGHT
SHANNON
MADISON
JASPER
LAWRENCE
BOLLINGER
SCOTT
CHRISTIAN
DOUGLAS
HOWELL
CARTER
WAYNE
STODDARD
NEWTON
STONE
BARRY
OREGON
RIPLEY
NEW MADRID
TANEY
OZARK
McDONALD
BUTLER
DUNKLIN
PEMISCOT
MISSOURI RIVER
MISSISSIPPI RIVER